

C L A I M S

1. A nitride semiconductor laser element
characterized by comprising: a semiconductor layer of a
first conductivity type, an active layer and a
5 semiconductor layer of a second conductivity type,
which are stacked one upon the other and each comprises
a nitride; a striped waveguide region for a laser light
provided on the semiconductor layer of the second
conductivity type; and an insulative region for
10 reducing the capacitance of the element, wherein a pn-
junction of the semiconductor layer at a peripheral
region remote from the waveguide region is broken.

2. A nitride semiconductor laser element
characterized by comprising: a semiconductor layer of a
15 first conductivity type, an active layer and
semiconductor layers of a second conductivity type,
which are stacked one upon the other and each comprises
a nitride; a striped waveguide region for a laser light
provided on the semiconductor layer of the second
20 conductivity type; and an insulative region for
reducing the capacitance of the element having no
depletion layer in the semiconductor layer at a
peripheral region remote from the waveguide region.

3. The nitride semiconductor laser element
25 according to claim 1 or 2, wherein the insulative
region for reducing the capacitance of the element is a
region formed by implanting ions from the surface of

the semiconductor layer of the second conductivity type.

4. A nitride semiconductor laser element characterized by comprising: a substrate; a
5 semiconductor layer of a first conductivity type, an active layer and a semiconductor layer of a second conductivity type, which are stacked on a main surface of the substrate and each comprises a nitride; a
10 striped waveguide region for a laser light provided on the semiconductor layer of the second conductivity type; an embedded insulation film covering a side face of the waveguide region and a surface of the semiconductor layer of the second conductivity type; a
15 first electrode in contact with a surface of the waveguide region; a protective insulation film covering at least a part of the embedded insulation film; a second electrode substantially connected to the semiconductor layer of the first conductivity type; and
20 an insulative region for reducing the capacitance of the element, provided by converting at least a part of the semiconductor layer at a peripheral region remote from the waveguide region into a higher resistance one by ion implantation.

5. The nitride semiconductor laser element
25 according to any one of claims 1 to 4, wherein the insulative region for reducing the capacitance of the element has an impurity peak concentration in the range

from 1×10^{18} to 5×10^{21} atoms/cm³.

6. The nitride semiconductor laser element according to any one of claims 1 to 4, wherein the insulative region for reducing the capacitance of the element has a peak of distribution of the impurity concentration in the depth direction in the range from 200 nm to 1 μ m from the surface of the semiconductor layer of the second conductivity type.

7. The nitride semiconductor laser element according to any one of claims 4 to 6, wherein the first electrode is formed in contact with the surface of the waveguide region so as to cover a part of the embedded insulation film, a pad electrode is formed in contact with the first electrode so as to cover a part of the protective insulation film, and the insulative region for reducing the capacitance of the element includes a region below the embedded insulation film.

8. The nitride semiconductor laser element according to any one of claims 4 to 6, wherein the first electrode is formed in contact with the surface of the waveguide region so as to cover a part of the embedded insulation film, a pad electrode is formed in contact with the first electrode so as to cover a part of the protective insulation film, and the insulation region for reducing the capacitance of the element includes at least the first electrode or a region below the pad electrode.

9. The nitride semiconductor laser element according to any one of claims 1 to 8, wherein the semiconductor laser element is a laser element for emitting bluish-purple light, and has responsiveness to input of pulse drive current of 1 ns or less.

10. A nitride semiconductor laser element characterized by comprising: a semiconductor layer of a first conductivity type, an active layer and a semiconductor layer of a second conductivity type, which are stacked one upon the other and each comprises a nitride; a striped waveguide region of a laser light provided on the semiconductor layer of the second conductivity type; and an insulative region having a withstand voltage of 10V or more at a region other than the waveguide region in the semiconductor of the second conductivity type.

11. A nitride semiconductor laser element characterized by comprising: a semiconductor layer of a first conductivity type, an active layer and a semiconductor layer of a second conductivity type being different from the first conductivity type, which are stacked on a main surface of a substrate and each comprises a nitride; and a striped waveguide region for a laser light provided on the semiconductor layer of the second conductivity type, wherein at least a part of the semiconductor layer of the second conductivity type serves as a region for reducing the capacitance of

the element by being converted into the first conductivity type in a direction of thickness at a peripheral region remote from the waveguide region.

12. The nitride semiconductor laser element
5 according to claim 11, having an npn structure in the peripheral region remote from the waveguide region, wherein the semiconductor layer of the first conductivity type is an n-type semiconductor layer, and the semiconductor layer of the second conductivity type
10 is a p-type semiconductor layer.

13. The nitride semiconductor laser element according to claim 11, having a pnpn structure in the peripheral region remote from the waveguide region, wherein the semiconductor layer of the first
15 conductivity type is an n-type semiconductor layer, and the semiconductor layer of the second conductivity type is a p-type semiconductor layer.

14. A bluish-purple light emitting laser element characterized by comprising: a semiconductor layer of a
20 first conductivity type, an active layer and a semiconductor layer of a second conductivity type, which are stacked one upon the other and each comprises a nitride; and a striped waveguide region of a laser light provided on the semiconductor layer of the second
25 conductivity type, wherein the element comprises an insulation region for reducing the capacitance of the element in a peripheral region remote from the

waveguide region, and wherein responsiveness of the element with respect to input of a pulse drive current is 1 ns or less.